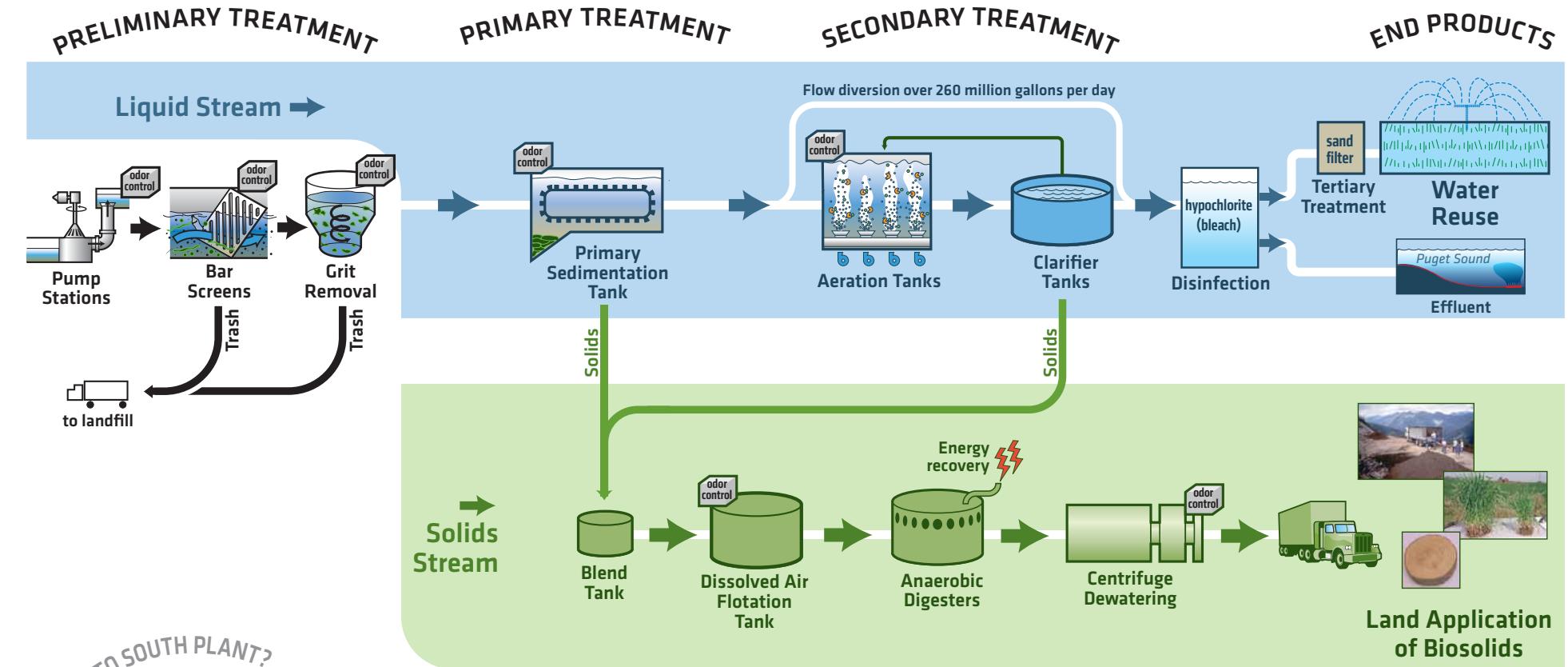
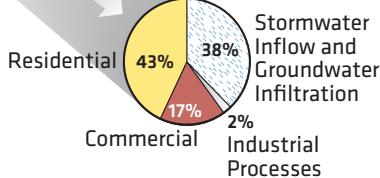


# South Plant Treatment Process



Typical Flows by Source  
During the Winter Months



## SOUTH PLANT FACTS

**Design average wet weather flow:**  
115 million gallons per day  
**Design secondary capacity:**  
240 million gallons per day  
**Design maximum capacity:** 325 million gallons per day during peak storms  
**Length of effluent transfer pipe from South Treatment Plant to Duwamish Head:**  
12 miles  
**Outfall pipe:** 10,000 feet long, 625 feet deep, 500-foot diffuser  
**Reclaimed water produced:**  
about 100 million gallons per year

**Biosolids produced:**  
about 60,000 wet tons per year  
**Methane gas produced:**  
about 1.8 million therms per year  
**Expected electrical production:** up to 33 million kilowatt-hours per year  
**Septage (waste from septic tanks) treated:**  
about 24 million gallons per year  
**Average dry weather flow:**  
76 million gallons per day  
**Average wet weather flow:**  
92 million gallons per day



King County  
Department of  
Natural Resources and Parks  
Wastewater Treatment Division

# South Treatment Plant

## Treatment Processes

### 1. Preliminary Treatment: Trash and dirt removal

Bar screens filter trash that enters the treatment plant. All trash removed is trucked to a landfill.

The water then enters a pre-aeration tank where air is added to help separate the dirt, rocks, sand and gravel (grit) out of the water. The removed grit is trucked to a landfill.

### 2. Primary Treatment: Settling out organic solids

Water enters primary sedimentation tanks and slows down. Oils and grease float to the surface and heavy organics (human waste, food waste) settle to the bottom. Scrapers remove the solids from the surface and bottom of the tank and those materials are piped to the solids treatment system.

This processes removes approx. 60% of the organic solid waste. The treated water is sent to secondary treatment.

### 3. Secondary Treatment: Biological treatment, bacteria & air

Water is pumped into aeration tanks: air and bacteria (return activated sludge from later in the process) are added to the 60 percent clean water. The air activates the bacteria causing them to reproduce and eat suspended and dissolved organic waste left in the water.

This mixture of air, bacteria and 60 percent clean water will enter a secondary clarifier. The bacteria/biomass will settle to the bottom of the tank and most (90 percent) will be returned to the aeration basins to become the next batch of activated bacteria. The remaining 10 percent will be sent to solids treatment.

The remaining water leaves the clarifier after removing 85-95 percent of solids and biological oxygen demand (BOD).

### 4. Disinfection: Destroying pathogens

Water is disinfected using hypochlorite (a strong bleach). This destroys most remaining bacteria and pathogens in the water before it is sent to Puget Sound.

#### Resource Recovery - Reclaimed Water

After disinfection some water will be further treated in a sand filter. This process uses advanced filtration and disinfection producing water that is approx. 99.9 percent cleaner than when it came into the plant, and clean enough to meet Class A Reclaimed Water standards and is primarily used for irrigation.

*Approximately 70 million gallons of sewage come through South Plant everyday, carrying trash, dirt, organic waste, pathogens, and household chemicals from homes and businesses on the south and east sides of Lake Washington.*

#### Pretreatment:

Industries, factories, breweries and other businesses are required to pre-treat their wastewater before sending it to the treatment plant. This protects the biological treatment processes and helps ensure the quality of the effluent entering the Puget Sound, and the reclaimed water and Loop® biosolids that are returned to our communities and environment.

### 5. Solids Treatment: Biological treatment and dewatering

The organic solids removed during primary and secondary treatment are (1) blended together (2) thickened (3) Digested—biologically broken down (4) dewatered and converted into Loop biosolids.

The dewatering processes use polymer to help solids coagulate and dewater quickly making treatment and transportation more effective.

The Digestion process grows anaerobic bacteria in a hot (98°F), no-oxygen environment to break down the organic waste. As the bacteria decompose the waste it is converted into nutrients and biogas.

#### Resource Recovery : Loop biosolids (nutrients)

The solids treatment process produces both nutrients and biogas from the month long decomposition of organic waste. The nutrient rich biosolids product is called Loop™ and is sold to farms and forests as an alternative to chemical fertilizers. It can also be composted further to create Groco, a nutrient rich compost product for gardens and landscapes.

#### Resource Recovery : Energy

The biogas is recycled onsite as fuel to produce hot water and electricity through a co-generation process. South Plant also cleans and sells the biogas to Puget Sound Energy to heat and fuel homes around the region.

#### You can help:

- Flush only human waste and toilet paper. Other ‘flushable’ products are NOT good for sewer systems.
- Use simple, biodegradable personal and cleaning products. Find recipes to make your own!
- Control rain water: stormwater is big problem for water quality. Install a rain garden, rain barrels or cisterns. Find simple ways to prevent runoff pollution.